Ejercicios 4.1

5. Determine u+v, u-v, 2u, y 3u-2v si:

a.

```
sage] u= vector([2,3])
sage] v= vector([-2,5])
sage] u+v
```

$u+v=(0,8)$

```
sage] u-v
```

$u-v=(4,-2)$

```
sage] 2*u
```

$2(u)=(4,6)$

```
sage](3*u)-(2*v)
```

$3u-2v=(10,-1)$

b.

```
sage]u= vector([0,3])
sage]v= vector([3,2])
sage]u+v
```

$u+v=(3,5)$

```
sage]u-v
```

$u-v=(-3,1)$

```
sage]2*u
```

$2(u)=(0,6)$

```
sage](3*u)-(2*v)
```

$3u-2v=(-6,5)$

c.

```
sage]u= vector([2,6])
sage]v= vector([3,2])
sage]u+v
```

$u+v=(5,8)$

```
sage]u-v
```

$u-v=(-1,4)$

```
sage]2*u
```

$2(u)=(4,12)$

```
sage](3*u)-(2*v)
```

$3u-2v(0,14)$

6. Repita el ejercicio 5 para:

a.

```
sage]u= vector([-1,3])
```

```
sage]v= vector([-2,5])
sage]u+v
```

$$u+v=(-3,8)$$

```
sage]u-v
```

$$u-v=(1,-2)$$

```
sage]2*u
```

$$2(u)=(-2,6)$$

```
sage](3*u)-(2*v)
```

$$3u-2v=(1,-1)$$

b.

```
sage]u= vector([-4,-3])
sage]v= vector([5,2])
sage]u+v
```

$$u+v=(1,-1)$$

```
sage]u-v
```

$$u-v=(-9,-5)$$

```
sage]2*u
```

$$2(u)=(-8,-6)$$

```
sage](3*u)-(2*v)
```

$$3u-2v=(-22,-13)$$

c.

```
sage]u= vector([2,3])
sage]v= vector([-2,0])
sage]u+v
```

$$u+v=(0,3)$$

```
sage]u-v
```

$$u-v=(4,3)$$

```
sage]2*u
```

$$2(u)=(4,6)$$

```
sage](3*u)-(2*v)
```

$$3(u)-2(v)=(10,9)$$

8. Sea:

```
sage]u= vector([-4,3])
sage]v= vector([2,-5])
sage]w= vector([-2,-9])
```

Determinar:

a. w=2u+3v

```
sage](2*u)+(3*v)
```

$$w=(-2,-9)$$

b. u+w=2(u)-v

```
sage](2*u)-v
```

$u + w = (-10, 11)$

9. Determine la norma de los siguientes vectores:
a. (1,2)

```
sage]v= vector([1,2])
sage]v.norm()
```

$\sqrt{5}$

b. (-3,-4)

```
sage]u= vector([-3,-4])
sage]u.norm()
```

5

c. (0,2)

```
sage]v= vector([0,2])
sage]v.norm()
```

2

d. (-4,3)

```
sage]s= vector([-4,3])
sage]s.norm()
```

5

10. Determine la norma de los sigueintes vectores:
a. (-2,3)

```
sage]v= vector([-2,3])
sage]v.norm()
```

$\sqrt{13}$

b. (3,0)

```
sage]u= vector([3,0])
sage]u.norm()
```

3

c. (-4,-5)

```
sage]j= vector([-4,-5])
sage]j.norm()
```

$\sqrt{41}$

d. (3,2)

```
sage]k= vector([3,2])
sage]k.norm()
```

$\sqrt{13}$